

IN THE CLAIMS:

Please cancel claims 2-4 and 6-8.

Please amend claims 1, 5 and 9-12 and add new claims 13-28 as follows:

1. (currently amended) ~~A paper~~An improved web cleaning apparatus, of the type comprising:

_____ a rotatable first paperweb buffing roll; and

_____ a rotatable second paperweb buffing roll in ~~in closely spaced parallel~~

relation adjacent to the first paperweb buffing roll, ~~the first paper buffing roll and the second paper buffing roll mounted to rotate towards each other, each buffing roll associated with a hood connected to a vacuum system;~~ and

_____ a paper web ~~passes~~passing between the first paper web buffing roll and the second paper web buffing roll so as to be ~~equally spaced from the first paper buffing roll and the second paper buffing roll~~, wherein the improvement comprises:

each of the first paper and second web buffing rolls comprising:

_____ a hollow core having:

_____ a cylindrical an outer surface, and ~~mounted for rotation between~~

_____ stub shafts on which that web buffing roll rotates, an outer surface of each stub shaft engaging an inner surface of the hollow core, and

_____ a material jacket positioned tightly about the hollow core outer surface and clamped between opposed end caps to ~~the ends of the hollow core, the jacket material being affixed to the hollow core surface and having a soft outwardly facing~~outer surface with having a profusion of radially protruding fibers developed thereon.

2. (cancelled).

3. (cancelled).

4. (cancelled).

5. (currently amended) ~~A paper~~An improved web cleaning apparatus, of the type comprising a ~~paper~~rotatable web buffing roll in ~~in closely spaced parallel relation adjacent~~ to a paper web, the paperweb buffing roll ~~mounted for rotation and enclosed within a hood connected to a vacuum system,~~ wherein the improvement comprises:

the paperweb buffing roll comprising:

_____ a hollow core, having:

~~_____ a core surface, the hollow core mounted for rotation between and~~
~~_____ stub shafts on which the web buffing roll rotates, and~~
~~_____ a jacket positioned tightly about the hollow core, and the jacket material~~
being held to, but not bonded to, the core surface and having a soft outwardly facing outer surface
having a profusion of radially-outwardly projecting fibers developed thereon.

6. (cancelled).

7. (cancelled).

8. (cancelled).

9. (currently amended) A method of cleaning a paper web using a web cleaning device
comprising:

~~_____ a rotatable first web buffing roll, comprising:~~
~~_____ a hollow core having:~~
~~_____ an outer surface, and~~
~~_____ stub shafts on which the first web buffing roll rotates, an outer~~
surface of each sub shaft engaging an inner surface of the hollow core, and
~~_____ a jacket positioned tightly about the outer surface and clamped between~~
opposed end caps to ends of the hollow core, the jacket having a outer surface and having a
profusion of protruding fibers extending from the outer surface of the jacket, the jacket being
continuous at least along an axis of the hollow core;

~~_____ a rotatable second roll adjacent to the first web buffing roll, the web positioned~~
between the first web buffing roll and the second roll; and

~~_____ at least one vacuum hood connected to a vacuum system, one vacuum hood~~
associated with the first web buffing roll, the method comprising the steps of:

~~_____ fabricating a core from a thin-walled cylinder approximately 20 to approximately~~
60 inches long between bearing supports, and at least about 3½ inches in diameter;

~~_____ balancing the core about an axis defined by the bearing supports;~~

~~_____ placing a woven wool jacket about the core;~~

~~_____ shrinking the wool jacket until it tightly engages the core;~~

~~_____ developing a soft surface having a profusion of radially extending fibers on the~~
wool jacket;

~~_____ placing the core within a vacuum hood, drawing a vacuum on the hood and~~

~~driving the core to rotate;~~

~~_____ placing the soft radially extending fiber surface on the wool jacket in close touching engagement to a surface of a paper web, which is moving in a direction opposed to the surface velocity of the roll, at a velocity in excess of 16 fps, to wear the surface into tangential engagement with the paper surface;~~

~~_____ passing the web between the first web buffing roll and the second roll in a first direction, a first boundary layer of an ambient atmosphere moving with the web in the first direction;~~

~~_____ rotating the first web buffing roll such that a portion of the first web buffing roll adjacent the web moves in a direction opposite the first direction, a second boundary layer of the ambient atmosphere moving with the first web buffing roll;~~

~~_____ without contacting the web with the first web buffing roll, interacting at least with one of the protruding fibers or the second boundary layer with at least one of the web or the first boundary layer to transfer loose materials from at least one of the web or the first boundary layer into at least one of the second boundary layer or the jacket;~~

~~_____ continuing to operate removing the transferred loose materials from at least one of the second boundary layer or the jacket using the at least one vacuum hood and vacuum system, comprising operating the ~~core~~ first web buffing roll within the vacuum hood, while drawing a vacuum on the vacuum hood and ~~driving~~ rotating the ~~core to rotate so as~~ first web buffing roll to produce an effective surface velocity of the first web buffing roll to clean the paper web, moving in excess of 16 fps.~~

10. (currently amended) The method of claim 9, wherein the the ~~effective~~ effective surface velocity of the first web buffing roll is at least approximately 60 to approximately 80 fps.

11. (currently amended) The method of claim 9, further comprising replacing the wool jacket by the steps of, comprising:

~~_____ removing the first web buffing roll from the associated one of the at least one vacuum hood;~~

~~_____ cutting removing the wool jacket along an axial direction defined by the thin-walled cylinder from around the hollow core;~~

~~_____ placing a new jacket around the hollow core;~~

~~_____ shrinking at the new wool jacket until ~~the~~ the new jacket tightly engages the the outer~~

surface of the hollow core;

~~developing a profusion of soft radially extending fibers on~~ extending from the
new wool-jacket;

~~placing the core~~ first web buffing roll within the associated one of the at least one
vacuum hood;

~~drawing a vacuum on the~~ that vacuum hood and ~~driving~~ rotating the ~~core to~~
rotate first web buffing roll;

~~placing the soft radially extending fiber surface on the wool jacket in close~~
~~touching engagement to~~ contacting a surface of a paper the web, which is moving in a direction
~~opposed to the surface velocity of the roll, with the extending fibers~~ to wear the surface into
~~tangential engagement with~~ extending fibers so that the extending fibers no longer frictionally
engage the paper surface;

~~continuing to operate the core within the vacuum hood, while drawing a vacuum~~
~~on the hood and driving the core to rotate so as to produce an effective surface velocity to clean~~
~~the paper of the web.~~

12. (currently amended) A method of cleaning a surface of a paper web wherein the
paper web is moving in a first direction at the velocity of at least 16 feet per second, the method
comprising the steps of:

~~fabricating a core from a hollow cylinder at least 20 inches long between bearing~~
~~supports, and at least about 3½ inches in diameter;~~

~~balancing the core about an axis defined by the bearing supports;~~

~~placing a jacket about the core;~~

~~shrinking the jacket until it tightly engages the core;~~

~~developing a soft surface having a profusion of radially extending fibers on the~~
~~jacket;~~

~~placing the core within a vacuum hood, drawing a vacuum on the hood and~~
~~driving the core to rotate with~~ rotating a roller at a surface velocity of between at least about 60
and about 80 feet per second in a direction opposite the first direction; the roller comprising:

a hollow core having:

an outer surface, and

stub shafts on which the roller rotates, an outer surface of each sub shaft

engaging an inner surface of the hollow core; and

a jacket positioned tightly about the outer surface of the hollow core and clamped between opposed end caps to ends of the hollow core, the jacket having a outer surface and having a profusion of protruding fibers extending from the outer surface of the jacket, the jacket being continuous at least along an axis of the hollow core;

placing the soft radially extending fiber surface on the jacket in close tangential engagement to the surface of the paper web to allow the profusion of protruding fibers extending from the outer surface of the jacket to interact with a boundary layer carried along with the paper web to remove particles from at least one of the surface of the paper web or the boundary layer carried along with the web.

13. (new) The improved web cleaning apparatus of claim 1, wherein, for each of the first and second web buffing rolls, the jacket extends continuously around the outer surface.

14. (new) The improved web cleaning apparatus of claim 1, wherein, for each of the first and second web buffing rolls, an axial length of the hollow core is substantially greater than a diameter of the hollow core.

15. (new) The improved web cleaning apparatus of claim 1, wherein, for each of the first and second web buffing rolls, that web buffing roll is positioned relative to the web such that the profusion of protruding fibers do not contact the web.

16. (new) The improved web cleaning apparatus of claim 5, wherein the jacket extends continuously around the outer surface.

17. (new) The improved web cleaning apparatus of claim 5, wherein an axial length of the hollow core is substantially greater than a diameter of the hollow core.

18. (new) The improved web cleaning apparatus of claim 5, wherein the web buffing roll is positioned relative to the web such that the profusion of outwardly protruding fibers do not contact the web.

19. (new) An improved paper web cleaning apparatus, comprising:
a rotatable first web buffing roll;
a rotatable second web buffing roll adjacent to the first web buffing roll; and
a web passing between the first web buffing roll and the second web buffing roll,
wherein each of the first and second web buffing rolls comprise:

a hollow core having:

a outer surface, and
stub shafts on which that web buffing roll rotates, an outer surface
of each stub shaft engaging an inner surface of the hollow core, and

a jacket positioned tightly about the outer surface and clamped between
opposed end caps to ends of the hollow core, the jacket having a soft outer surface and having a
profusion of protruding fibers.

20. (new) The improved web cleaning apparatus of claim 19, wherein, for each of the
first and second web buffing rolls, the jacket extends continuously around the outer surface.

21. (new) The improved web cleaning apparatus of claim 19, wherein, for each of the
first and second web buffing rolls, an axial length of the hollow core is substantially greater than
a diameter of the hollow core.

22. (new) The improved web cleaning apparatus of claim 19, wherein, for each of the
first and second web buffing rolls, that web buffing roll is positioned relative to the web such
that the profusion of protruding fibers do not contact the web.

23. (new) An improved web cleaning apparatus, comprising a rotatable web buffing roll
adjacent to a web, the web buffing roll enclosed within a hood connected to a vacuum system
and comprising:

a hollow core having:

a core surface, and

stub shafts on which the web buffing roll rotates, and

a jacket positioned tightly about the hollow core, the jacket being held to, but not
bonded to, the core surface and having a soft outer surface having a profusion of outwardly
projecting fibers.

24. (new) The improved web cleaning apparatus of claim 23, wherein the jacket extends
continuously around the outer surface.

25. (new) The improved web cleaning apparatus of claim 23, wherein an axial length of
the hollow core is substantially greater than a diameter of the hollow core.

26. (new) The improved web cleaning apparatus of claim 23, wherein the web buffing
roll is positioned relative to the web such that the profusion of outwardly protruding fibers do not
contact the web.

27. (new) A method of cleaning a web using a web cleaning device comprising:

a rotatable first web buffing roll, comprising
a hollow core having:
an outer surface, and
stub shafts on which the first web buffing roll rotates, and
a jacket positioned tightly about the outer surface and clamped between
opposed end caps to ends of the hollow core, the jacket having a outer surface and having a
profusion of protruding fibers extending from the outer surface of the jacket, the jacket being
continuous at least along an axis of the hollow core;

a rotatable second roll adjacent to the first web buffing roll, the web positioned
between the first web buffing roll and the second roll; and

at least one hood connected to a vacuum system, at least one hood associated with
the first web buffing roll, the method comprising:

passing the web between the first web buffing roll and the second roll in a first
direction, a first boundary layer of an ambient atmosphere moving with the web in the first
direction;

rotating the first web buffing roll such that a portion of the first web buffing roll
adjacent the web moves in a direction opposite the first direction, a second boundary layer of the
ambient atmosphere moving with the first web buffing roll;

interacting the protruding fibers with the first boundary layer to transfer loose
materials from the web or first boundary layer into the second boundary layer or jacket;

removing the transferred loose materials from at least one of the second boundary
layer and the jacket using the at least one hood and vacuum system.

28. (new) A method of cleaning a web using a web cleaning device, comprising:

passing a web between a first web buffing roll and a second roll in a first
direction, a first boundary layer of an ambient atmosphere moving with the web in the first
direction, wherein:

the first web buffing roll is rotatable and comprises:

a hollow core having:

an outer surface, and

shafts on which the first web buffing roll rotates, an outer surface
of each shaft engaging an inner surface of the hollow core, and

a jacket positioned tightly about the outer surface of the hollow core and clamped between opposed end caps to ends of the hollow core, the jacket having a outer surface and having a profusion of protruding fibers extending from the outer surface of the jacket, the jacket being continuous at least along an axis of the hollow core, and

the web cleaning device includes at least one vacuum hood connected to a vacuum system, each vacuum hood associated with one of the first web buffing roll or the second roll;

rotating the first web buffing roll such that a portion of the first web buffing roll adjacent the web moves in a direction opposite the first direction, a second boundary layer of the ambient atmosphere moving with the first web buffing roll;

interacting at least one of the protruding fibers and the second boundary layer with the first boundary layer to transfer loose materials from at least one of the web or first boundary layer into at least one of the second boundary layer or jacket;

removing the transferred loose materials from at least one of the second boundary layer or the jacket using the at least one vacuum hood and vacuum system.